

# 在聯絡中心企業版中配置安全SIP信令

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## 簡介

本文說明如何在Contact Center Enterprise(CCE)綜合呼叫流程中保護會話初始協定(SIP)信令。

## 必要條件

憑證產生和匯入不在本檔案的範圍之內，因此必須建立思科整合通訊管理員(CUCM)、客戶語音入口網站(CVP)通話伺服器、思科虛擬語音瀏覽器(CVVB)和思科整合邊界元件(CUBE)的憑證，並將其匯入到各自的元件。如果使用自簽名證書，則必須在不同元件之間執行證書交換。

## 需求

思科建議您瞭解以下主題：

- CCE
- CVP
- 立方體
- CUCM
- CVVB

## 採用元件

本檔案中的資訊是根據套件客服中心企業版(PCCE)、CVP、CVVB和CUCM版本12.6，但也適用於之前的版本。



3. 運行這些命令以在傳出撥號對等體上啟用CVP。在此示例中，撥號對等標籤6000用於將呼叫路由到CVP。

```
Conf t dial-peer voice 6000 voip session target ipv4:198.18.133.13:5061 session transport tcp tls exit
```

```
CC-VCUBE#
CC-VCUBE#Conf t
Enter configuration commands, one per line. End with CNTL/Z.
CC-VCUBE(config)#dial-peer voice 6000 voip
CC-VCUBE(config-dial-peer)#session target ipv4:198.18.133.13:5061
CC-VCUBE(config-dial-peer)#session transport tcp tls
CC-VCUBE(config-dial-peer)#
CC-VCUBE(config-dial-peer)#exit
CC-VCUBE(config)#
```

## 任務2.CVP安全配置

在此任務中，配置CVP呼叫伺服器以保護SIP協定消息(SIP TLS)。

步驟：

1. 登入到UCCE Web Administration.
2. 導航至 Call Settings > Route Settings > SIP Server Group.

### Route Settings

Media Routing Domain Call Type Dialed Number Expanded Call Variables SIP Server Group

Properties

根據您的配置，您為CUCM、CVVB和CUBE配置了SIP伺服器組。您需要將所有安全SIP埠設定為5061。在此示例中，使用以下SIP伺服器組：

- cucm1.dcloud.cisco.com 對於CUCM
- vvb1.dcloud.cisco.com 適用於CVVB
- cube1.dcloud.cisco.com 對於CUBE

3. 按一下 cucm1.dcloud.cisco.com 然後在 **Members** 頁籤，其中顯示SIP伺服器組配置的詳細資訊。設定 SecurePort 成長至 5061 然後按一下 Save .

### Route Settings

Media Routing Domain Call Type Dialed Number Expanded Call Variables Sip Server Groups Routing Pattern

Edit cucm1.dcloud.cisco.com

General **Members**

List of Group Members

Hostname/IP	Priority	Weight	Port	SecurePort	Site
198.18.133.3	10	10	5060	5061	Main

4. 按一下 vvb1.dcloud.cisco.com 然後在 **Members** 頁籤。將SecurePort設定為 5061 然後按一下 Save.

Edit vvb1.dcloud.cisco.com

General

Members

List of Group Members

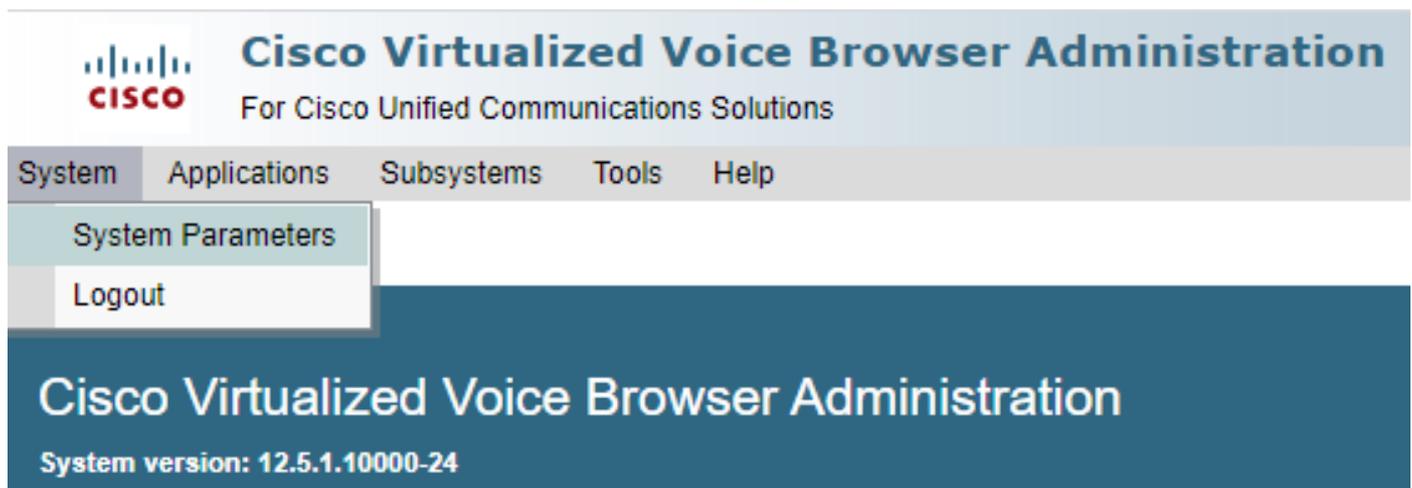
Hostname/IP	Priority	Weight	Port	SecurePort	Site
vvb1.dcloud.cisco.c...	10	10	5060	5061	Main

### 任務3.CVVB安全配置

在此任務中，配置CVVB以保護SIP協定消息(SIP TLS)。

步驟：

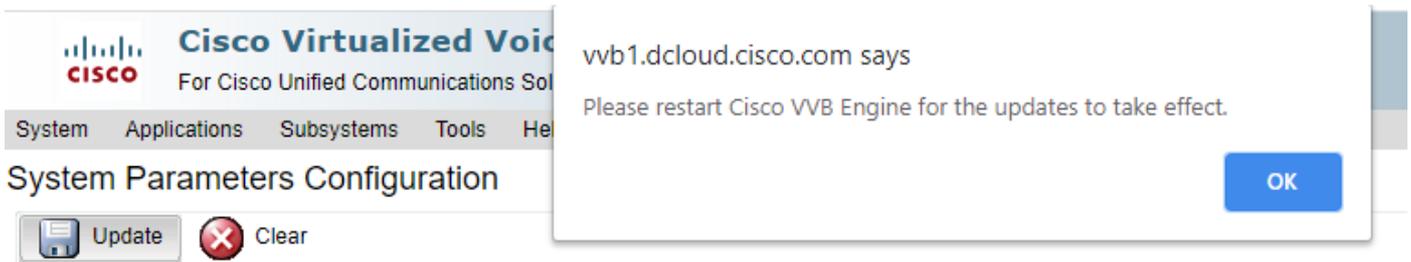
1. 登入到 **Cisco VVB Administration** 頁面。
2. 導航至 System > System Parameters.



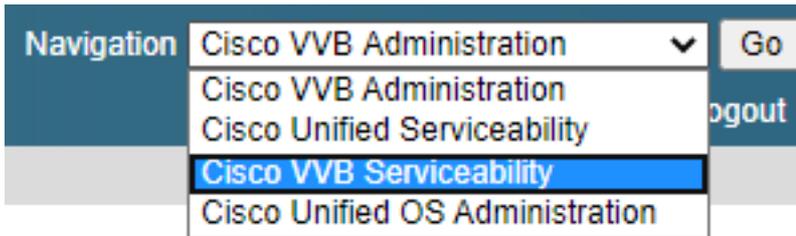
3. 在 Security Parameters 部分，選擇 Enable 對於 TLS(SIP)。保留 Supported TLS(SIP) version 作為 TLSv1.2.

Security Parameters	Parameter Name	Parameter Value	Suggested Value
	TLS(SIP)	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Disable
	Supported TLS(SIP) Versions	TLSv1.2	TLSv1.2
	► Cipher Configuration		TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
	SRTP [Crypto Suite : AES_CM_128_HMAC_SHA1_32]	<input checked="" type="radio"/> Disable <input type="radio"/> Enable <input type="checkbox"/> Allow RTP (Mixed mode)	Disable

4. 按一下「Update」。按一下 Ok 當提示重新啟動CVVB引擎時。



5. 這些更改需要重新啟動Cisco VVB引擎。要重新啟動VVB引擎，請導航至 Cisco VVB Serviceability 然後按一下 Go.



6. 導航至 Tools > Control Center – Network Services.



7. 選擇 Engine 然後按一下 Restart.

## Control Center - Network Services

Start Stop **Restart** Refresh

Status

**i** Ready

Select Server

Server \*

System Services	
	Service Name
<input type="radio"/>	Perfmon Counter Service
<input type="radio"/>	▼Cluster View Daemon
	▶Manager Manager
<input checked="" type="radio"/>	▼Engine
	▶Manager Manager
	▶Subsystem Manager

### 任務4.CUCM安全配置

要保護CUCM上的SIP消息，請執行以下配置：

- 將CUCM安全模式設定為混合模式
- 為CUBE和CVP配置SIP中繼安全配置檔案
- 將SIP中繼安全配置檔案關聯到各自的SIP中繼
- 安全代理與CUCM的裝置通訊

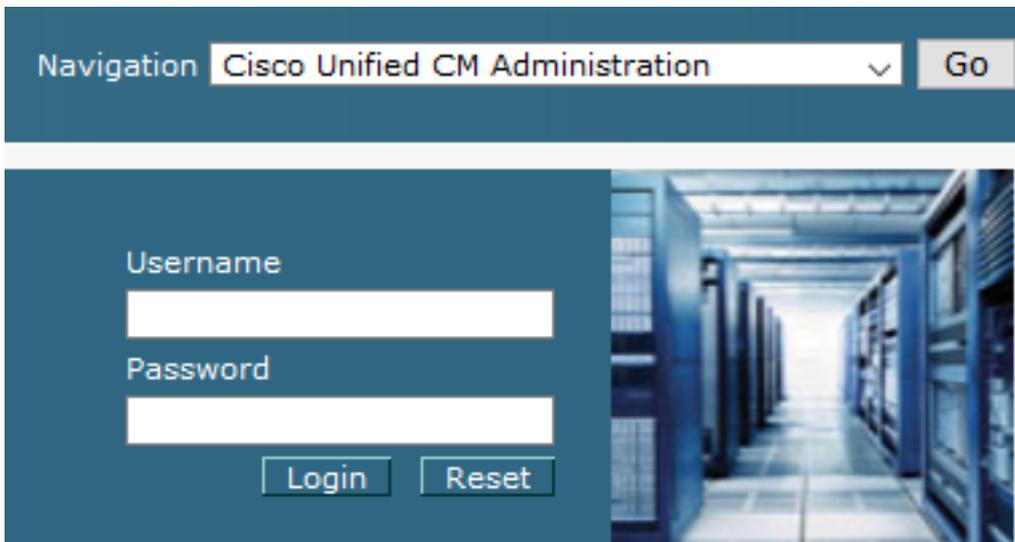
#### 將CUCM安全模式設定為混合模式

CUCM支援兩種安全模式：

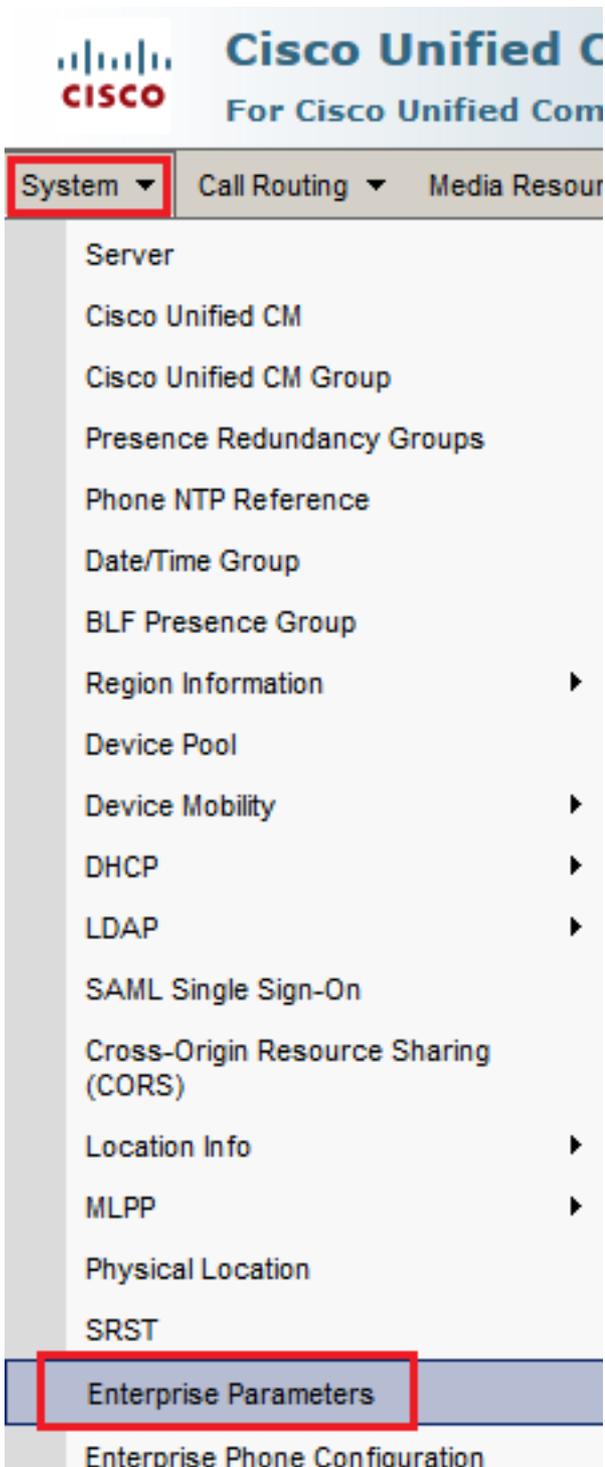
- 非安全模式 ( 預設模式 )
- 混合模式 ( 安全模式 )

步驟：

1. 若要將安全模式設定為混合模式，請登入到 [Cisco Unified CM Administration](#) 介面。



2. 成功登入到CUCM後，導航至 [System > Enterprise Parameters](#).



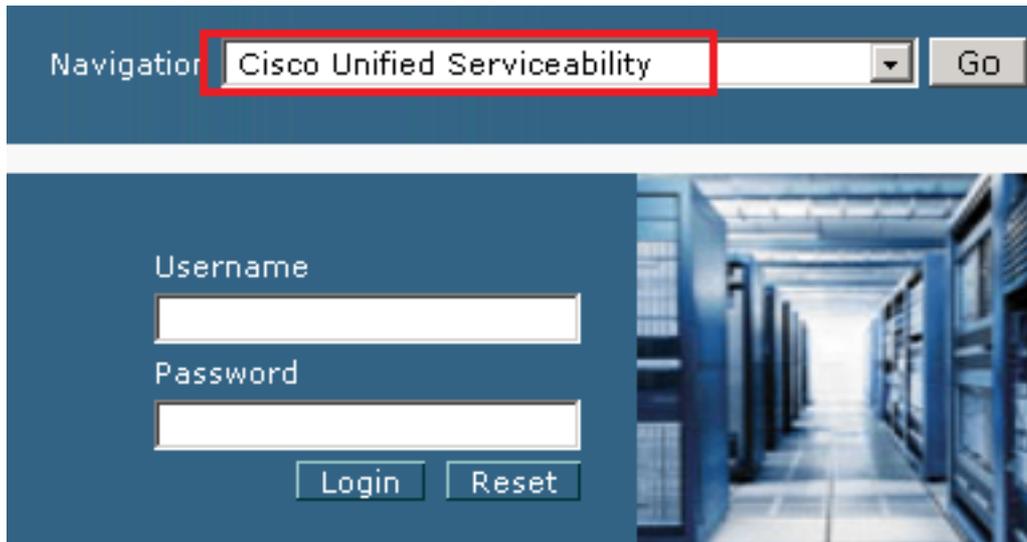
3. 在下面 Security Parameters 部分，檢查是否 Cluster Security Mode 設定為 0。



4. 如果群集安全模式設定為0，則表示群集安全模式設定為非安全。您需要從CLI啟用混合模式。
5. 開啟與CUCM的SSH會話。
6. 通過SSH成功登入到CUCM後，請運行以下命令：`utils ctl set-cluster mixed-mode`
7. 類型 `y` 並在系統提示時按一下Enter。此命令將群集安全模式設定為混合模式。

```
admin:utils ctl set-cluster mixed-mode
This operation will set the cluster to Mixed mode. Auto-registration is enabled on at least one CM node. Do you want to continue? (y/n): y
Moving Cluster to Mixed Mode
Cluster set to Mixed Mode
Please restart Cisco CallManager service and Cisco CTIManager services on all the nodes in the cluster that run these services.
admin:
```

8. 要使更改生效，請重新啟動 Cisco CallManager 和 Cisco CTIManager 服務。
9. 要重新啟動服務，請導航並登入到 Cisco Unified Serviceability。



The screenshot shows the Cisco Unified Serviceability web interface. At the top, there is a navigation bar with a dropdown menu set to "Cisco Unified Serviceability" and a "Go" button. Below this is a login form with fields for "Username" and "Password", and "Login" and "Reset" buttons. The background of the login form is a blue-tinted image of server racks in a data center.

10. 成功登入後，導航至 [Tools > Control Center – Feature Services](#).

**Cisco Unified Serviceability**  
For Cisco Unified Communications Solutions

Alarm ▾ Trace ▾ **Tools ▾** Snmp ▾ CallHome ▾ Help ▾

Service Activation

**Control Center - Feature Services**

Control Center - Network Services

Serviceability Reports Archive

Audit Log Configuration

Locations ▶

Dialed Number Analyzer

CDR Analysis and Reporting

CDR Management

System version 6

VMware Install (R) Xeon(R) CPU E5-

User admin last logged Monday, January 20, 20

Copyright © 1999 - All rights reserved.

This product contains compliance with U.S.

A summary of U.S. I

For information about Cisco Unified Communications Manager please

11. 選擇伺服器，然後按一下 Go.

**Select Server**

Server\*

12. 在CM服務下，選擇 Cisco CallManager 然後按一下 Restart 按鈕。

CM Services	
	Service Name
<input checked="" type="radio"/>	Cisco CallManager
<input type="radio"/>	Cisco Unified Mobile Voice Access Service
<input type="radio"/>	Cisco IP Voice Media Streaming App
<input type="radio"/>	Cisco CTIManager
<input type="radio"/>	Cisco Extension Mobility

13. 確認彈出消息，然後按一下 ok.等待服務成功重新啟動。

Restarting Service. It may take a while... Please wait for the page to refresh.  
If you see Starting/Stopping state, refresh the page after sometime to show the right status.



14. 成功重新啟動 Cisco CallManager，選擇Cisco CTIManager 然後按一下 Restart 按鈕以重新啟動 Cisco CTIManager 服務。

CM Services	
	Service Name
<input type="radio"/>	Cisco CallManager
<input type="radio"/>	Cisco Unified Mobile Voice Access Service
<input type="radio"/>	Cisco IP Voice Media Streaming App
<input checked="" type="radio"/>	Cisco CTIManager
<input type="radio"/>	Cisco Extension Mobility

15. 確認彈出消息，然後按一下 OK.等待服務成功重新啟動。

Restarting Service. It may take a while... Please wait for the page to refresh.  
If you see Starting/Stopping state, refresh the page after sometime to show the right status.



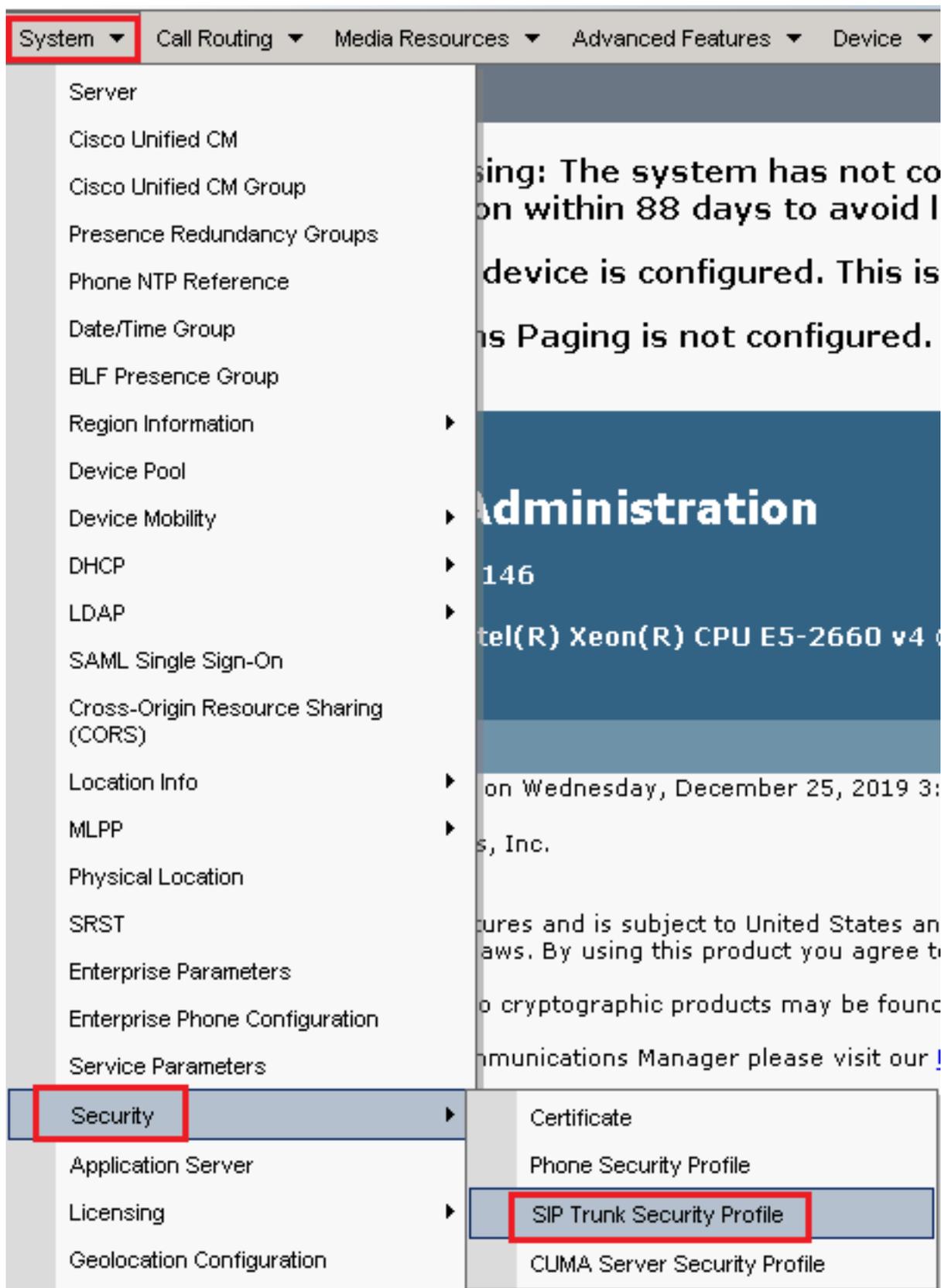
16. 服務成功重新啟動後，驗證群集安全模式是否設定為混合模式，然後按照步驟5中的說明導航到CUCM管理。然後檢查 Cluster Security Mode.現在必須設定為 1.

Security Parameters	
<a href="#">Cluster Security Mode</a> *	1
<a href="#">Cluster SIPOAuth Mode</a> *	Disabled

## 為CUBE和CVP配置SIP中繼安全配置檔案

步驟：

1. 登入到 CUCM administration 介面.
2. 成功登入到CUCM後，導航至 System > Security > SIP Trunk Security Profile 以便為CUBE建立裝置安全配置檔案。



3. 在左上角，按一下 **Add New** 以便新增新配置檔案。

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features

## Find and List SIP Trunk Security Profiles

 Add New  Select All  Clear All  Delete Selected

4. 設定 SIP Trunk Security Profile 如下圖所示，然後按一下 Save 位於頁面左下角 Save 它。

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk A

## SIP Trunk Security Profile Configuration

Related Links: [Back](#)

 Save  Delete  Copy  Reset  Apply Config  Add New

**- Status**

-  Add successful
-  Reset of the trunk is required to have changes take effect.

**- SIP Trunk Security Profile Information**

Name*	SecureSIPTLSforCube
Description	
Device Security Mode	Encrypted ▾
Incoming Transport Type*	TLS ▾
Outgoing Transport Type	TLS ▾
<input type="checkbox"/> Enable Digest Authentication	
Nonce Validity Time (mins)*	600
Secure Certificate Subject or Subject Alternate Name	SIP-GW
Incoming Port*	5061
<input type="checkbox"/> Enable Application level authorization	
<input type="checkbox"/> Accept presence subscription	
<input type="checkbox"/> Accept out-of-dialog refer**	
<input type="checkbox"/> Accept unsolicited notification	
<input type="checkbox"/> Accept replaces header	
<input type="checkbox"/> Transmit security status	
<input type="checkbox"/> Allow charging header	
SIP V.150 Outbound SDP Offer Filtering*	Use Default Filter ▾

5. 確保已設定好預設的 Secure Certificate Subject or Subject Alternate Name CUBE證書的公用名(CN)，因為它

必須匹配。

6. 按一下 Copy 按鈕並更改 Name 成長至 SecureSIPTLSforCVP 和 Secure Certificate Subject CVP 呼叫伺服器證書的CN，因為它必須匹配。按一下 Save 按鈕。

**Status**

- Add successful
- Reset of the trunk is required to have changes take effect.

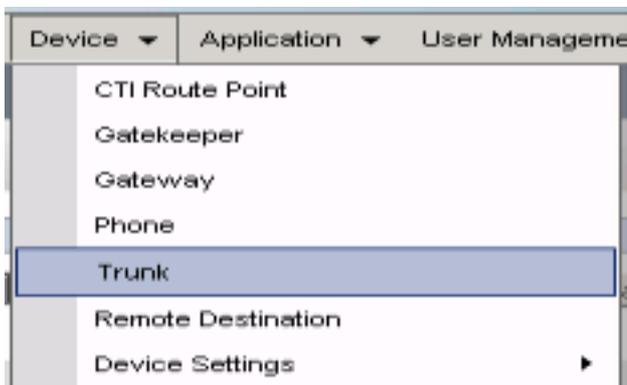
**SIP Trunk Security Profile Information**

Name*	SecureSIPTLSforCvp
Description	
Device Security Mode	Encrypted
Incoming Transport Type*	TLS
Outgoing Transport Type	TLS
<input type="checkbox"/> Enable Digest Authentication	
Nonce Validity Time (mins)*	600
Secure Certificate Subject or Subject Alternate Name	cvp1.dcloud.cisco.com
Incoming Port*	5061
<input type="checkbox"/> Enable Application level authorization	
<input type="checkbox"/> Accept presence subscription	
<input type="checkbox"/> Accept out-of-dialog refer**	
<input type="checkbox"/> Accept unsolicited notification	
<input type="checkbox"/> Accept replaces header	
<input type="checkbox"/> Transmit security status	
<input type="checkbox"/> Allow charging header	
SIP V.150 Outbound SDP Offer Filtering*	Use Default Filter

將SIP中繼安全配置檔案關聯到各自的SIP中繼

步驟：

1. 在CUCM管理頁面上，導航至 Device > Trunk.



2. 搜尋CUBE中繼。在本示例中，CUBE中繼名稱是 vCube。按一下 Find。

Trunks (1 - 5 of 5)

Find Trunks where Device Name begins with vCube Find Clear Filter

	Name	Description	Calling Search Space	Device Pool	Route Pattern	Partition
<input type="checkbox"/>	vCUBE		dCloud_CSS	dCloud_DP	cloudcherry.sip.twilio.com	dCloud_PT
<input type="checkbox"/>	vCUBE		dCloud_CSS	dCloud_DP	7800	PSTN_Incoming_Numbers
<input type="checkbox"/>	vCUBE		dCloud_CSS	dCloud_DP	6016	PSTN_Incoming_Numbers
<input type="checkbox"/>	vCUBE		dCloud_CSS	dCloud_DP	7019	PSTN_Incoming_Numbers
<input type="checkbox"/>	vCUBE		dCloud_CSS	dCloud_DP	44413XX	Robot Agent Remote Destinations

3. 按一下vCUBE以開啟vCUBE中繼配置頁。

4. 向下滾動到 SIP Information 部分，並更改 Destination Port 成長至 5061。

5. 變更 SIP Trunk Security Profile 成長至 SecureSIPTLSForCube。

SIP Information

Destination

Destination Address is an SRV

	Destination Address	Destination Address IPv6	Destination Port
1*	198.18.133.226		5061

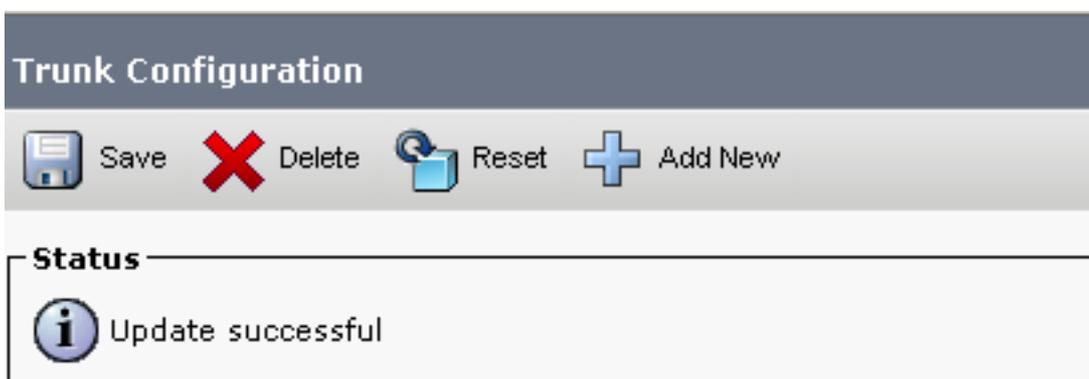
MTP Preferred Originating Codec\* 711ulaw

BLF Presence Group\* Standard Presence group

SIP Trunk Security Profile\* SecureSIPTLSforCube

Rerouting Calling Search Space < None >

6. 按一下 Save 然後 Rest 以 Save 並應用更改。



The configuration changes will not take effect on the trunk until a reset is performed. Use the Reset button or Job Scheduler to execute the reset.

OK

7. 導航至 Device > Trunk，並搜尋CVP中繼。在本示例中，CVP中繼名稱是 cvp-SIP-Trunk。按一下 Find。

Trunks (1 - 1 of 1)				
Find Trunks where				
<input type="checkbox"/>	Device Name	begins with	cvp	Find
Clear Filter <input type="button" value="+"/> <input type="button" value="-"/>				
Select item or enter search text				
<input type="checkbox"/>	Name ^	Description	Calling Search Space	Device Pool
<input type="checkbox"/>	 CVP-SIP-Trunk	CVP-SIP-Trunk	dCloud_CSS	dCloud_DP

8. 按一下 CVP-SIP-Trunk 以開啟CVP中繼配置頁面。
9. 向下滾動到 SIP Information 小節和更改 Destination Port 成長至 5061。
10. 變更 SIP Trunk Security Profile 成長至 SecureSIPTLSForCvp。

SIP Information		
<b>Destination</b>		
<input type="checkbox"/> Destination Address is an SRV		
<b>Destination Address</b>	<b>Destination Address IPv6</b>	<b>Destination Port</b>
1* 198.18.133.13		5061
MTP Preferred Originating Codec*	711ulaw	
BLF Presence Group*	Standard Presence group	
SIP Trunk Security Profile*	SecureSIPTLSforCvp	

11. 按一下 Save 然後 Rest 以 save 並應用更改。

Trunk Configuration	
 Save	 Delete
 Reset	 Add New
<b>Status</b>	
 Update successful	

The configuration changes will not take effect on the trunk until a reset is performed. Use the Reset button or Job Scheduler to execute the reset.

OK

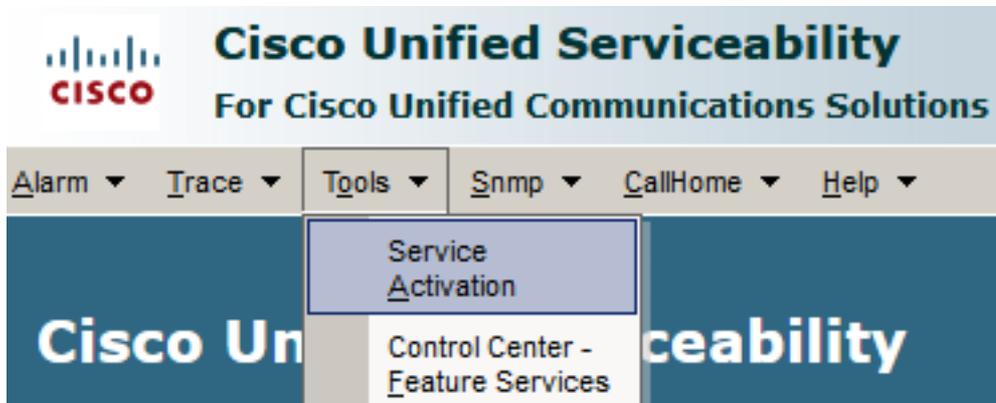
## 安全代理與CUCM的裝置通訊

要為裝置啟用安全功能，必須安裝本地重要證書(LSC)並為該裝置分配安全配置檔案。LSC擁有端點

的公鑰，該公鑰由憑證授權代理功能(CAPF)私鑰簽署。預設情況下，它不會安裝在電話上。

步驟：

1. 登入到 Cisco Unified Serviceability Interface.
2. 導航至 Tools > Service Activation.



3. 選擇CUCM伺服器並按一下 Go .

## Service Activation

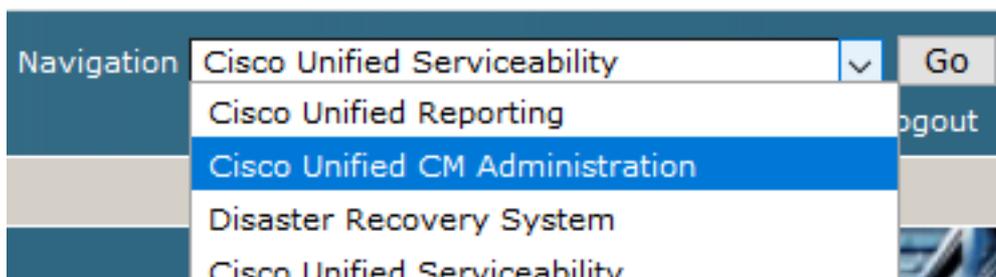
Select Server

Server\*

4. 支票 Cisco Certificate Authority Proxy Function 然後按一下 Save 啟用服務。按一下 Ok 確認。

Security Services		
	Service Name	Activation Status
<input checked="" type="checkbox"/>	Cisco Certificate Authority Proxy Function	Deactivated
<input type="checkbox"/>	Cisco Certificate Enrollment Service	Deactivated

5. 確保服務已啟用，然後導航至 Cisco Unified CM Administration.



6. 成功登入到CUCM管理後，導航至 System > Security > Phone Security Profile 為代理裝置建立裝置安全配置檔案。



# Cisco Unified CM Administration

For Cisco Unified Communications Solutions

System ▾

Call Routing ▾

Media Resources ▾

Advanced Features ▾

Devi

Server

Cisco Unified CM

Cisco Unified CM Group

Presence Redundancy Groups

Phone NTP Reference

Date/Time Group

BLF Presence Group

Region Information ▶

Device Pool

Device Mobility ▶

DHCP ▶

LDAP ▶

SAML Single Sign-On

Cross-Origin Resource Sharing (CORS)

Location Info ▶

MLPP ▶

Physical Location

SRST

Enterprise Parameters

Enterprise Phone Configuration

Service Parameters

Security ▶

Application Server

Licensing ▶

Geolocation Configuration

device is configured. The  
ns Paging is not configur

## Administration

7

tel(R) Xeon(R) CPU E5-2660

on Friday, December 20, 2019 10

s, Inc.

ures and is subject to United Stat  
aws. By using this product you ac

o cryptographic products may be

munications Manager please visit

our [Technical Support](#) web site.

Certificate

Phone Security Profile

SIP Trunk Security Profile

CUMA Server Security Profile

7. 查詢與您的代理裝置型別對應的安全配置檔案。在此示例中，使用的是軟體電話，因此選擇 Cisco Unified Client Services Framework - Standard SIP Non-Secure Profile，按一下 Copy 以便複製此配置檔案。

Phone Security Profile (1 - 1 of 1) Rows per Page 50

Find Phone Security Profile where Name contains client Find Clear Filter + -

Name	Description	Copy
<a href="#">Cisco Unified Client Services Framework - Standard SIP Non-Secure Profile</a>	Cisco Unified Client Services Framework - Standard SIP Non-Secure Profile	

8. 將配置檔案重新命名為 Cisco Unified Client Services Framework - Secure Profile，更改此圖中所示的引數，然後按一下 Save 在頁面的左上角。

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User

### Phone Security Profile Configuration

Save Delete Copy Reset Apply Config Add New

**Status**

Add successful

**Phone Security Profile Information**

**Product Type:** Cisco Unified Client Services Framework  
**Device Protocol:** SIP

Name\* Cisco Unified Client Services Framework - Secure Profile  
 Description Cisco Unified Client Services Framework - Secure Profile  
 Device Security Mode Encrypted ▾  
 Transport Type\* TLS ▾

TFTP Encrypted Config  
 Enable OAuth Authentication

**Phone Security Profile CAPF Information**

Authentication Mode\* By Null String ▾  
 Key Order\* RSA Only ▾  
 RSA Key Size (Bits)\* 2048 ▾  
 EC Key Size (Bits) < None > ▾

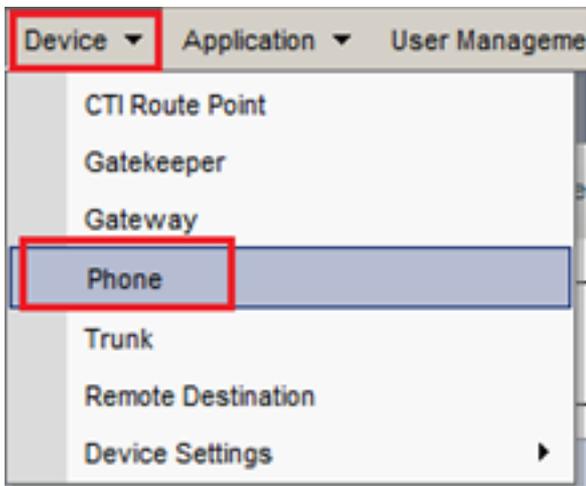
Note: These fields are related to the CAPF Information settings on the Phone Configuration page.

**Parameters used in Phone**

SIP Phone Port\* 5061

Save Delete Copy Reset Apply Config Add New

9. 成功建立電話裝置配置檔案後，導航至 Device > Phone.



10. 按一下 Find 要列出所有可用電話，請按一下座席電話。
11. 座席電話配置頁面開啟。尋找 Certification Authority Proxy Function (CAPF) Information 部分。要安裝 LSC，請設定 Certificate Operation 成長至 Install/Upgrade 和 Operation Completes by 到任何未來的日子。

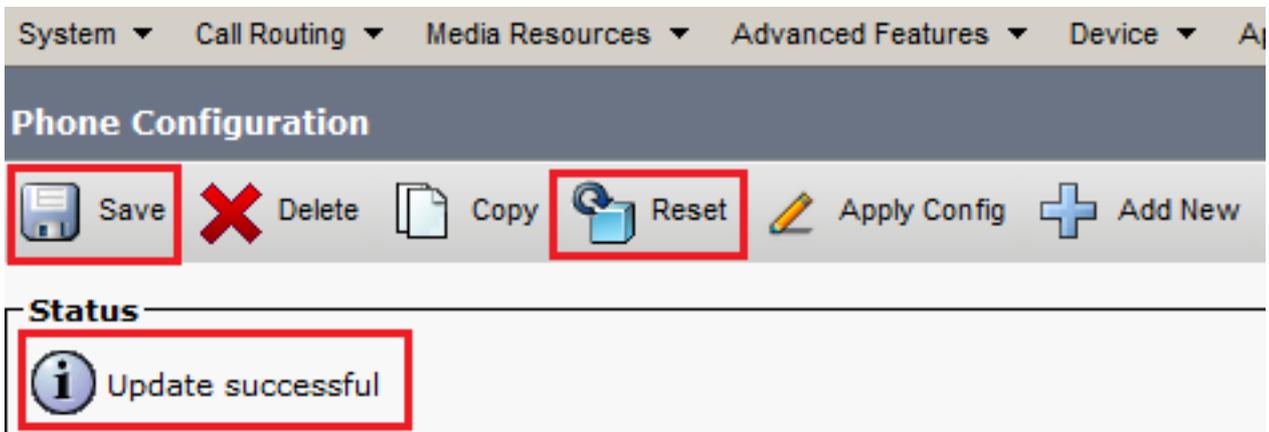
Certificate Operation*	Install/Upgrade
Authentication Mode*	By Null String
Authentication String	
Key Order*	RSA Only
RSA Key Size (Bits)*	2048
EC Key Size (Bits)	
Operation Completes By	2021 04 16 12 (YYYY:MM:DD:HH)

Certificate Operation Status: None  
Note: Security Profile Contains Addition CAPF Settings.

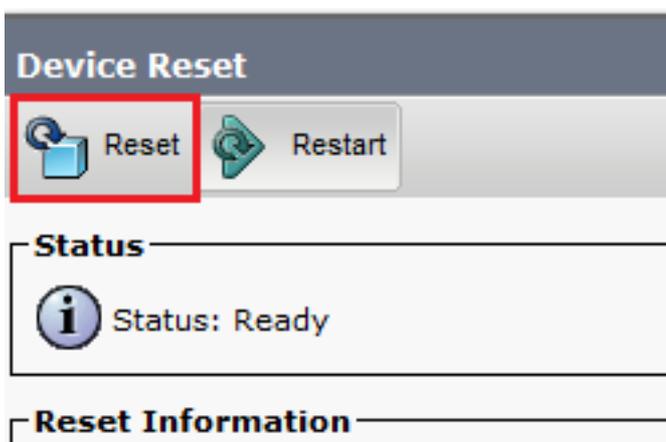
12. 尋找 Protocol Specific Information 部分。變更 Device Security Profile 成長至 Cisco Unified Client Services Framework – Secure Profile.

Packet Capture Mode*	None
Packet Capture Duration	0
BLF Presence Group*	Standard Presence group
SIP Dial Rules	< None >
MTP Preferred Originating Codec*	711ulaw
Device Security Profile*	Cisco Unified Client Services Framework - Secure Profile
Rerouting Calling Search Space	Cisco Unified Client Services Framework - Secure Profile

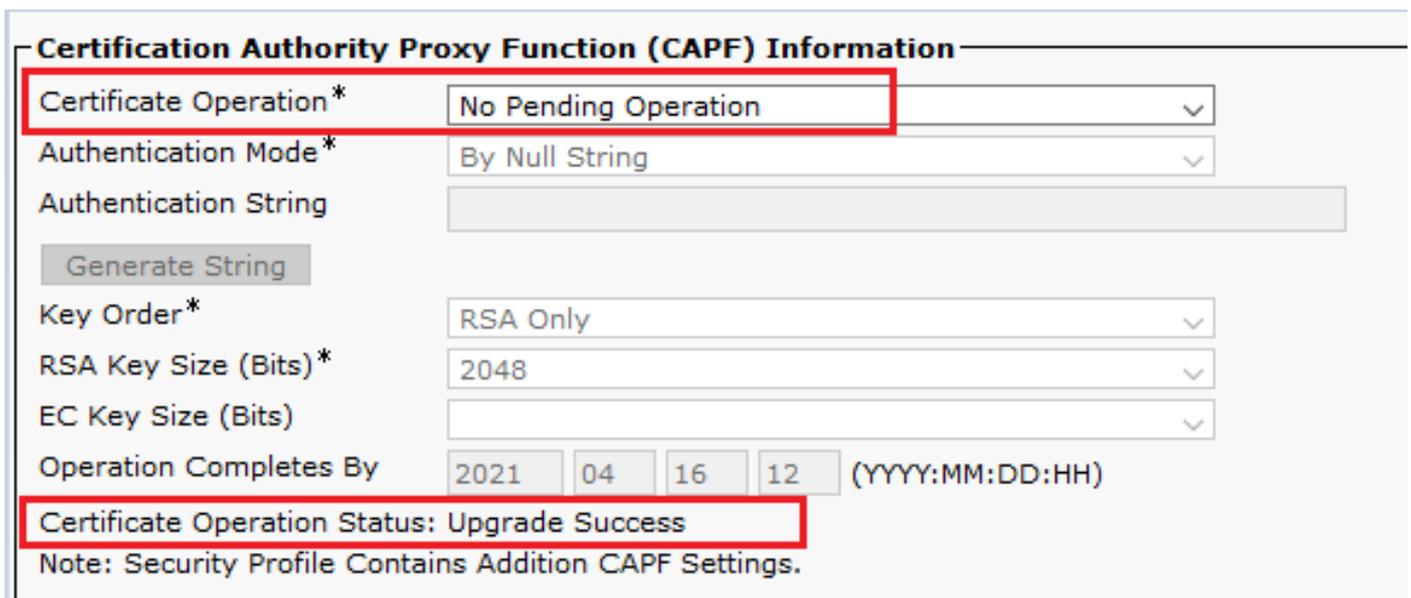
13. 按一下 Save 在頁面的左上角。確保更改已成功儲存，然後按一下 Reset.



14. 此時將開啟一個彈出視窗，按一下 **Reset** 確認操作。



15. 代理裝置再次向CUCM註冊後，請刷新當前頁面並驗證LSC是否安裝成功。支票 **Certification Authority Proxy Function (CAPF) Information** 部分，**Certificate Operation** 必須設定為 **No Pending Operation**，和 **Certificate Operation Status** 設定為 **Upgrade Success**。



16. 請參閱步驟。7-13，以保護要用於通過CUCM保護SIP的其他代理裝置。

## 驗證

要驗證SIP信令是否正確安全，請執行以下步驟：

1. 開啟與vCUBE的SSH會話，運行命令 `show sip-ua connections tcp tls detail`，並確認當前未與CVP(198.18.133.13)建立TLS連線。

```
CC-VCUBE#show sip-ua connections tcp tls detail
Total active connections      : 1
No. of send failures         : 0
No. of remote closures       : 34
No. of conn. failures        : 0
No. of inactive conn. ageouts : 12
TLS client handshake failures : 0
TLS server handshake failures : 0

-----Printing Detailed Connection Report-----
Note:
** Tuples with no matching socket entry
  - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port>'
    to overcome this error condition
++ Tuples with mismatched address/port entry
  - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port> id <connid>'
    to overcome this error condition

Remote-Agent:198.18.133.3, Connections-Count:1
  Remote-Port Conn-Id Conn-State WriteQ-Size Local-Address TLS-Version
  =====
      44868      49 Established          0          -      TLSv1.2

Remote-Agent:198.18.133.13, Connections-Count:0

----- SIP Transport Layer Listen Sockets -----
Conn-Id      Local-Address
=====
0            [0.0.0.0]:5061;
```



注意：此時，在CUCM(198.18.133.3)上僅啟用一個具有CUCM的SIP選項的活動TLS會話。如果未啟用SIP選項，則不存在SIP TLS連線。

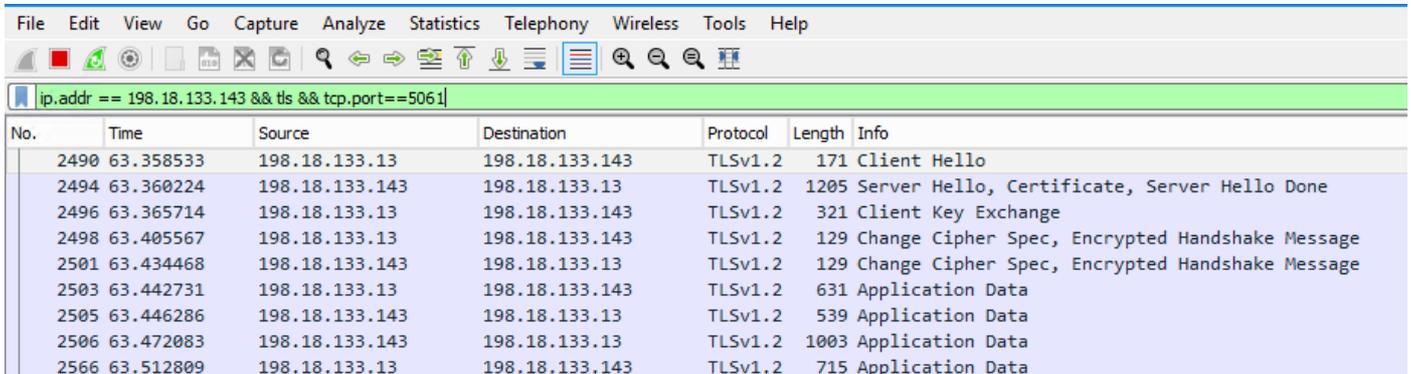
2. 登入到CVP並啟動Wireshark。
3. 向聯絡中心號碼發出測試呼叫。
4. 導航到CVP會話；在Wireshark上，運行此過濾器以使用CUBE檢查SIP信令：  
`ip.addr == 198.18.133.226 && tls && tcp.port==5061`

No.	Time	Source	Destination	Protocol	Length	Info
2409	63.180370	198.18.133.226	198.18.133.13	TLSv1.2	173	Client Hello
2411	63.183691	198.18.133.13	198.18.133.226	TLSv1.2	1153	Server Hello, Certificate, Server Hello Done
2414	63.188871	198.18.133.226	198.18.133.13	TLSv1.2	396	Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
2415	63.202820	198.18.133.13	198.18.133.226	TLSv1.2	60	Change Cipher Spec
2416	63.203063	198.18.133.13	198.18.133.226	TLSv1.2	123	Encrypted Handshake Message
2419	63.207380	198.18.133.226	198.18.133.13	TLSv1.2	614	Application Data
2421	63.255349	198.18.133.13	198.18.133.226	TLSv1.2	635	Application Data
2508	63.495508	198.18.133.13	198.18.133.226	TLSv1.2	1067	Application Data
2565	63.505008	198.18.133.226	198.18.133.13	TLSv1.2	587	Application Data

**檢查：**是否已建立SIP over TLS連線？如果是，則輸出確認CVP和CUBE之間的SIP訊號是安全的。

5.檢查CVP和CVVB之間的SIP TLS連線。在同一Wireshark會話中，運行此過濾器：

```
ip.addr == 198.18.133.143 && tls && tcp.port==5061
```



The image shows a Wireshark interface with a filter applied: `ip.addr == 198.18.133.143 && tls && tcp.port==5061`. The packet list table below shows the following entries:

No.	Time	Source	Destination	Protocol	Length	Info
2490	63.358533	198.18.133.13	198.18.133.143	TLSv1.2	171	Client Hello
2494	63.360224	198.18.133.143	198.18.133.13	TLSv1.2	1205	Server Hello, Certificate, Server Hello Done
2496	63.365714	198.18.133.13	198.18.133.143	TLSv1.2	321	Client Key Exchange
2498	63.405567	198.18.133.13	198.18.133.143	TLSv1.2	129	Change Cipher Spec, Encrypted Handshake Message
2501	63.434468	198.18.133.143	198.18.133.13	TLSv1.2	129	Change Cipher Spec, Encrypted Handshake Message
2503	63.442731	198.18.133.13	198.18.133.143	TLSv1.2	631	Application Data
2505	63.446286	198.18.133.143	198.18.133.13	TLSv1.2	539	Application Data
2506	63.472083	198.18.133.143	198.18.133.13	TLSv1.2	1003	Application Data
2566	63.512809	198.18.133.13	198.18.133.143	TLSv1.2	715	Application Data

**檢查：**是否已建立SIP over TLS連線？如果是，則輸出確認CVP和CVVB之間的SIP訊號是安全的。

6.您還可以通過CUBE驗證與CVP的SIP TLS連線。導航到vCUBE SSH會話，然後運行此命令以檢查安全sip訊號：

```
show sip-ua connections tcp tls detail
```

```

CC-VCUBE#show sip-ua connections tcp tls detail
Total active connections      : 2
No. of send failures         : 0
No. of remote closures      : 0
No. of conn. failures        : 0
No. of inactive conn. ageouts : 0
TLS client handshake failures : 0
TLS server handshake failures : 0

-----Printing Detailed Connection Report-----
Note:
** Tuples with no matching socket entry
  - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port>'
    to overcome this error condition
++ Tuples with mismatched address/port entry
  - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port> id <connid>'
    to overcome this error condition

Remote-Agent:198.18.133.3, Connections-Count:1
  Remote-Port Conn-Id Conn-State  WriteQ-Size Local-Address TLS-Version
  =====
      38896      2 Established      0           -           TLSv1.2

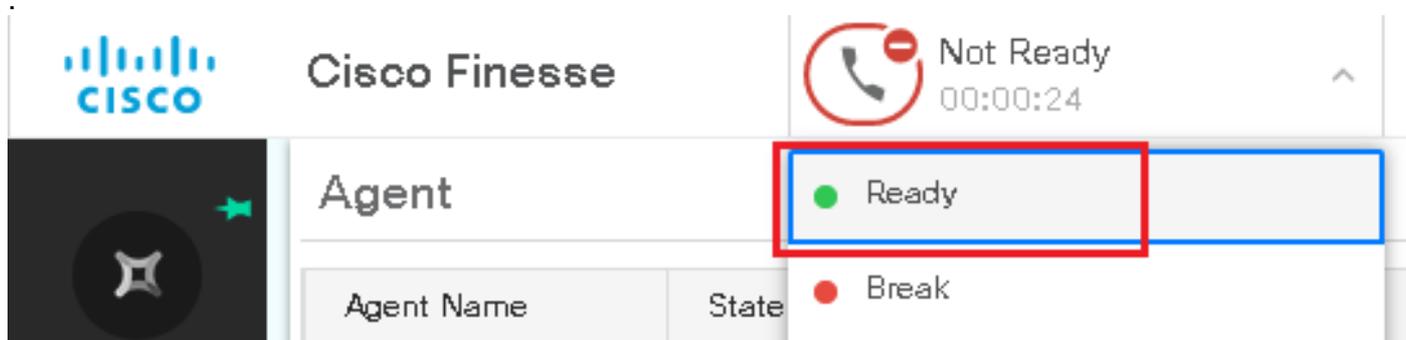
Remote-Agent:198.18.133.13, Connections-Count:1
  Remote-Port Conn-Id Conn-State  WriteQ-Size Local-Address TLS-Version
  =====
      5061      3 Established      0           -           TLSv1.2

----- SIP Transport Layer Listen Sockets -----
  Conn-Id          Local-Address
  =====
      0            [0.0.0.0]:5061:

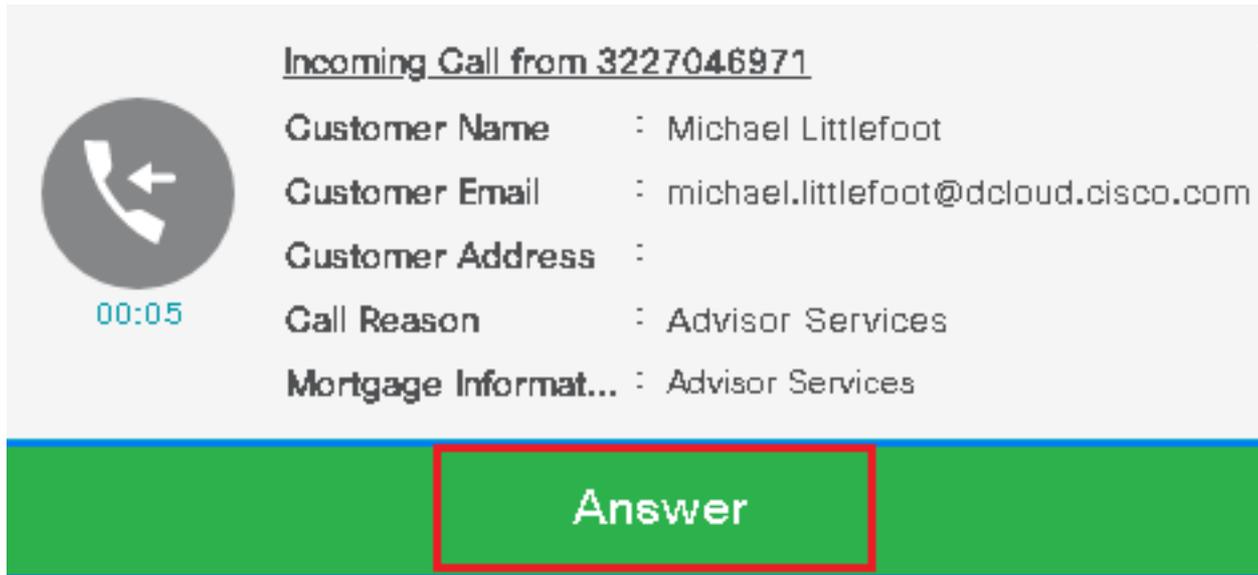
```

**檢查:**SIP over TLS是否與CVP建立連線？如果是，則輸出確認CVP和CUBE之間的SIP訊號是安全的。

- 7.此時，呼叫處於活動狀態，並且您聽到「通話等待音樂」(MOH)，因為沒有可以應答呼叫的座席。
- 8.使座席可以應答呼叫。



9.座席將被保留，並且呼叫將被轉接給他/她。按一下 Answer 來接電話。



Incoming Call from 3227046971

Customer Name : Michael Littlefoot  
Customer Email : michael.littlefoot@dcloud.cisco.com  
Customer Address :  
Call Reason : Advisor Services  
Mortgage Informat... : Advisor Services

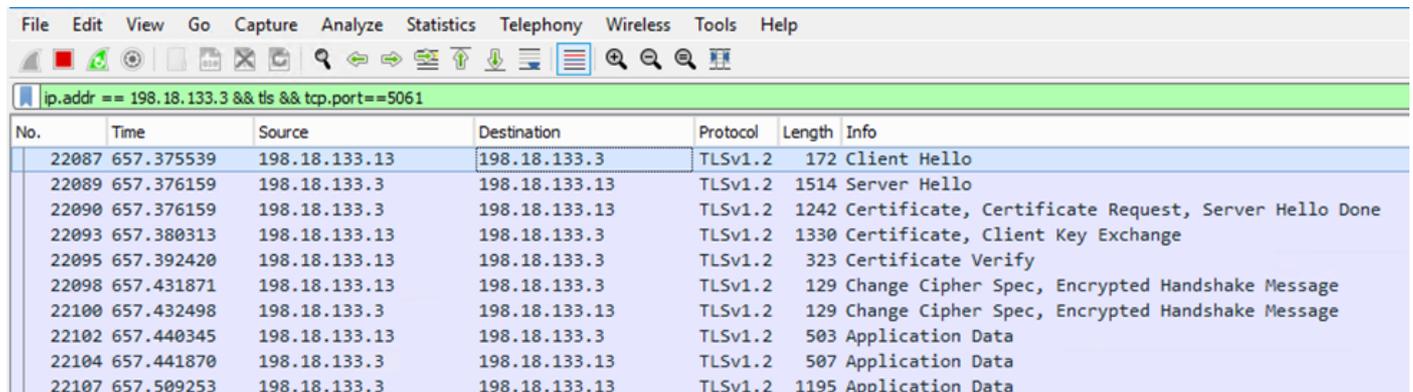
00:05

Answer

10.呼叫連線到座席。

11.為了驗證CVP和CUCM之間的SIP訊號，請導航到CVP會話，然後在Wireshark中運行此過濾器：

```
ip.addr == 198.18.133.3 && tls && tcp.port==5061
```



No.	Time	Source	Destination	Protocol	Length	Info
22087	657.375539	198.18.133.13	198.18.133.3	TLSv1.2	172	Client Hello
22089	657.376159	198.18.133.3	198.18.133.13	TLSv1.2	1514	Server Hello
22090	657.376159	198.18.133.3	198.18.133.13	TLSv1.2	1242	Certificate, Certificate Request, Server Hello Done
22093	657.380313	198.18.133.13	198.18.133.3	TLSv1.2	1330	Certificate, Client Key Exchange
22095	657.392420	198.18.133.13	198.18.133.3	TLSv1.2	323	Certificate Verify
22098	657.431871	198.18.133.13	198.18.133.3	TLSv1.2	129	Change Cipher Spec, Encrypted Handshake Message
22100	657.432498	198.18.133.3	198.18.133.13	TLSv1.2	129	Change Cipher Spec, Encrypted Handshake Message
22102	657.440345	198.18.133.13	198.18.133.3	TLSv1.2	503	Application Data
22104	657.441870	198.18.133.3	198.18.133.13	TLSv1.2	507	Application Data
22107	657.509253	198.18.133.3	198.18.133.13	TLSv1.2	1195	Application Data

**檢查：**是否所有與CUCM(198.18.133.3)的SIP通訊均通過TLS?如果是，則輸出確認CVP和CUCM之間的SIP訊號是安全的。

## 疑難排解

如果未建立TLS，請在CUBE上運行以下命令以啟用debug TLS進行故障排除：

- Debug ssl openssl errors
- Debug ssl openssl msg
- Debug ssl openssl states

## 關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。